"A RANDOMIZED CONTROLLED TRIAL TO ASSESS THE CLINICAL AND FUNCTIONAL OUTCOMES IN PATIENTS OF *BHAGANDAR* (TRANSSPHINCTERIC ANAL FISTULA) USING MIKST (MINIMAL INVASIVE KSHAR SUTRA TECHNIQUE), LIFT (LIGATION OF INTERSPHINCTERIC FISTULA TRACT) AND STANDARD APAMARGA KSHAR SUTRA THERAPY"

National Institute of Ayurveda,

Deemed To Be University (De-Novo) Jaipur, Rajasthan

PROPOSED SYNOPSIS

FOR THE DEGREE OF

***Āyurveda Vidyāvāridhī* (Ph.D.)**

Scholar
Dr Nasreen Hanifa
M. S. (Ayu.)
Ph.D Scholar

Supervisor

Prof. (Dr.) P. Hemantha Kumar
M.S, Ph.D. (Ayu.)
HOD & Dean-PG Studies

PG Department Shalya Tantra

National Institute of Ayurveda, Deemed To Be University (De-Novo)

Jorawar Singh Gate, Amer Road, Jaipur, Rajasthan – 302002

APPLICATION OF DISSERTATION

To
The Registrar
National Institute of Ayurveda
Deemed to be University (De-novo), Jaipur (Rajasthan)

Through: - Proper Channel

Subject: -Submission of the Plan of dissertation / Protocol for the award of *Āyurveda Vidyāvāridhī* (Ph.D.) in the specialty of Shalya Tantra

Respected Sir,
With due regards, I am here by submitting the Protocol of my research project for the award of *Āyurveda Vidyāvāridhī* (Ph.D.) in the specialty of Shalya Tantra. The particulars are given below**:**

Name of the Scholar	Dr. Nasreen Hanifa
Father's Name	Late B I Barbhuiya
Date of Birth	01-02-1993
Permanent address	Flat no. 1305, T-8, Panchsheel Hynish, Greater Noida West, UP-201306
Enrollment No.	Applied
Previous exam passed	M.S. (Shalya Tantra)
Institution	National Institute of Ayurveda, Deemed to be University (De-Novo), Jaipur (Rajasthan)
Language of the Thesis	English, Sanskrit, Hindi
Title	**A RANDOMIZED CONTROLLED TRIAL TO ASSESS THE CLINICAL AND FUNCTIONAL OUTCOMES IN PATIENTS OF *BHAGANDAR* (TRANSSPHINCTERIC ANAL FISTULA) USING MIKST** (MINIMAL INVASIVE KSHAR SUTRA TECHNIQUE), **LIFT** (LIGATION OF INTERSPHINCTERIC FISTULA TRACT) **AND STANDARD APAMARGA KSHAR SUTRA THERAPY**
Department	Shalya Tantra

Scholar
Dr Nasreen Hanifa
M. S. (Ayu.)
Ph.D. Scholar

Supervisor
Prof. (Dr.) P. Hemantha Kumar
M.S, Ph.D. (Ayu.)
HOD & Dean - PG Studies

PG Department Shalya Tantra

National Institute of Ayurveda, Deemed To Be University (De-Novo)

Jorawar Singh Gate, Amer Road, Jaipur, Rajasthan – 302002

A RANDOMIZED CONTROLLED TRIAL TO ASSESS THE CLINICAL AND FUNCTIONAL OUTCOMES IN PATIENTS OF *BHAGANDAR* (TRANSSPHINCTERIC ANAL FISTULA) USING MIKST (MINIMAL INVASIVE KSHAR SUTRA TECHNIQUE), LIFT (LIGATION OF INTERSPHINCTERIC FISTULA TRACT) AND STANDARD APAMARGA KSHAR SUTRA THERAPY

INTRODUCTION

Anal fistula is one of the most prevalent ailments in Ano-rectal disease associated with long term impact and challenges encountered during its management. The prevalence is greater in men than women, with a rate of 12.3 cases per 100,000 and 5.6 cases per 100,000, respectively.[1] Various emerging treatment modalities are available in Ayurvedic as well as contemporary science for fistula-in-ano but none proved to be ideal. Though comparative clinical trials are being done globally for anal fistula but drawback and limitations are associated with every intervention so we are not able to reach the final conclusion that which approach is best for the management of this perplexing disease.

Acharya Sushruta, the father of surgery and the author of *Sushruta Samhita*[2] has mentioned *Kshar Sutra* therapy for the management of *Bhagandar* and it has already been incorporated as standard operating care for anal fistula with least chance of recurrence and incontinence. However, nowadays minimal invasive techniques are gaining more popularity due to its better patient compliance and outcome. Minimal invasive surgery continues to play an important role since it is efficient, safe and is convenient for surgeons as well as patients.[3] MIKST is a novel sphincter saving technique which can yield treatment outcome with lesser duration as compared to conventional *Kshar Sutra* therapy.

Contemporary science also did a lot of work to propose an ideal treatment for anal fistula and LIFT (Ligation of Intersphincteric fistula tract)[4] procedure is emerging as a good sphincter saving technique.[5] Apart from LIFT, other interventions include fistulectomy[6], fistulotomy[7], anal fistula plug, fibrin or cyanoacrylate glue injection[8], endorectal advancement flap[9] and video-assisted anal fistula treatment[10]. All techniques carry some degree of incontinence and risk of recurrence.[11] Few of these are difficult procedures to perform and require highly experienced surgeons or high-technology equipment. Therefore, here we have planned of this comparative study in Transsphincteric Anal fistula.

This study compares efficacy of all techniques on same assessment parameters of the disease because till date no comparative study has been conducted using these three modalities i.e; MIKST, LIFT and Standard *Apamarga Kshar Sutra* therapy.

NEED OF THE STUDY

Nowadays multiple innovative approaches available for the repair of anal fistulae but the best technique is not known and the available evidence suffers from a lack of high quality data with very few large RCTs. Considering tissue preservation and minimal invasive method, current surgical practice lacks novel modality for anal fistula. Our Ayurveda science also actively contribute *Kshar Sutra* application for *Bhagandar* management in *Sushruta Samhita* and many studies also conducted in various institutions on this methodology but no any comparative data are available in contemporary as well as Ayurvedic science on these procedures i.e. MIKST, LIFT and Standard *Apamarga Kshar Sutra* therapy**.** After arrival of this data, maybe we will give better advise to our society for the management of this illness.

PREVIOUS WORKS

National Institute of Ayurveda, Jaipur.

- Sunita Dalal (1990) - *Bhagandar* ke paripekshya mein Ksharsutron ki jivanuon par karmukata ka adhyayan
- Mishra S.P. (1990) - *Bhagandar* chikitsa mein Vishyandana taila evam Kshara (*Ksharasutra*) ki karmukata
- Mishra B.B. (1991) - Management of *Bhagandar* by Dantyadi Sutra
- Sharma S.G. (1992-1993) *Bhagandar* ki chikitsa mein Udumbar Ksheera Coated *Ksharasutra* ka tulanatmaka adhyayan
- Ramana Mohan D.S. (1994) A Clinical Study on the management of Shataponaka *Bhagandar* (Multiple Fistula-in-ano)
- Shah Raj Kishor (1995) - Effect of Snuhi-Ksheera extract Ksharsutra in Fistula-in-ano.
- Singh Arun Kumar (2003) - Evaluation of efficacy of Commiphora mukul and Ropana Dravya coated *Ksharasutra* in the management of *Bhagandar*
- Singh Aditya Kumar (2004) An indigenous approach to manage the *Bhagandar* (Fistula-in-ano) by two steps therapy (Kshara Sutra and Ropana Dravya Sutra)
- Aradhyamath Siddayya (2006) - Clinical study of management of *Bhagandar* w. s. r. to Parisravi *Bhagandar*
- P. Hemantha Kumar (2009) - Evaluate the Efficacy of *Madhu Kshara Sutra, Vishyandana Taila* and *Panchatikta Ghrita Guggulu* in the management of *Bhagandar* (Fistula-in-ano)
- Sonal Chaturvedi (2010) - Clinical Evaluation and Comparative Analysis of Pilu Taila, Jaati Taila and Pilu Jaati Taila with Apamarga Kshara Sootra in the management of fistula-in-ano
- Dr. Sudha Rani (2012) A Comparative Study of Fistulotomy with Standard *Ksharasutra* in the management of Fistula in ano
- Dr. Arvind Kumar Goswami (2012) A comparative study of *Nimba Ksharasutra* and *Haridra Ksharasutra* in the management of *Bhagandar* (Fistula in Ano)
- Dr. Kuldeep Singh Bhati (2013) - Management of *Bhagandar* (Fistula-in-ano) with Palasha *Ksharasutra* and Nishadhya Taila

- Dr. Alok Kumar (2015) - A Clinical Study to evaluate the efficacy of *Kadali, Aragvadh* and *Palash Ksharsutra* in the Management of *Vataj. Pittaj* and *Kaphaj Bhagandara*
- Dr. Shaheen Ahmad Mir (2017) - A clinical study on the efficacy of *Vibhitaka Ksharsutra* in the management of *Bhagandar* (Fistula-in-ano)
- Dr. Sumit Baberwal (2020) A clinical study on the efficacy of Minimal Invasive *Kshar Sutra* Technique (MIKST) in the management of *Bhagandar* w.s.r. to anal fistula

B.H.U, Varanasi.

- Sharma K.R. (1968) - Role of *Ksharasutra* in the management of *Bhagandar*
- Pandey S.K. (1974) - Role of *Kshara Karma* in Anorectal disorder
- Sharma K.P. (1974) Evaluation of various types of *Ksharasutra* in different types of *Bhagandar*
- Jain R.K. (1975) Effect of *Arka Ksheera Ksharasutra* in the treatment of Fistula-in-ano
- Tripathi A.K. (1976) - Management of high rectal Fistula with *Ksharasutra*
- Rao I.V.P. (1977) - Management of recurrent Fistula-in-ano by *Ksharasutra*
- Malhotra B.S. (1979) - Management of multiple Fistula-in-ano by *Ksharasutra*
- Das N.P. (1980) - Role of Fistulography in the management of Fistula-in-ano by *Ksharasutra*
- Singh A.K. (1981) Studies on bacteriological status of fistulous tract during treatment by *Ksharasutra*
- Singh Raman (1984) - Role of *Udumbar Ksheera Sutra* in *Bhagandar*
- Singh O.P. (1985) - Role of Papaya *Ksheera Sutra* in *Bhagandar*
- Ahiwar S.K. (1986) A comparative study of operation on recurred and non-operated cases of *Bhagandar* with *Ksharasutra*
- Gupta Arvind (1986) - Studies on *Ksharasutra* prepared by Snuhi Swarasa
- Rajendra Prasad (1987) - Further studies on Papaya *Ksheera Sutra* in cases of Fistula-in-ano
- Ravishankar P.C. (1988) - Effect of modified *Ksharasutra* in the management of Fistula-in-ano
- Shailendra (1989) - Studies on management of high rectal Fistula by *Ksharasutra* combined with surgery
- Vidyarthi Anand (1990) - Studies on *Yava-Kshara* (coated) *Kshara Sootra* in the management of Fistula-in-ano
- Narsinga Rao J. (1993) Critical analysis and assessment of *Ksharasutra* in the management of Fistula-in-ano
- Reddy P. Subba (1994) - Evaluation of Ghrita Kumari Kshara Sootra in Fistula in-ano
- Singh R.K. (1995) Studies on Fistula-in-ano (*Bhagandar*) treated with *Ksharasutra* prepared with Tankana (Borax)
- Kumar P. Hemantha (1996) - Effect of *Aragvadhadi Sootra* in the management of *Bhagandar* (Fistula-in-ano))
- Nagaraj P. (1998) – Histopathological Study of *Kshara Sutra* in the Management of *Bhagandar* (Fistula-in-ano)
- Praveen Kumar (1999) Study of *Guggulu* based *Kshara Sutra* in the management of *Bhagandar* (Fistula-in-ano)
- Yadav A. K. (2000) - Study of *Guggulu* based *Kshara Sootra* in the management of high anal

fistula

- Singh S. K. (2003) - Role of Guggulu based Kshara Sootra in the management of recurrent high anal fistula

Gujarat Ayurveda University, Jamnagar.

- Dave I. M. (1975) - *Bhagandar* (*Ksharasutra* Chikitsatmak Visheshadhyayan)
- Kshirsagan T.D. (1979)- A comparative study of various methods in treatment of Fistula-in-ano
- Raichur H.V. (1983) Role of different *Ksharasutra* in the management of *Bhagandar*.
- Narenda M. (1987) - Management of *Bhagandar* with Aragvadhadi Sutra
- Walung R.T. (1987) - Management of Fistula-in-ano with an indigenous drug
- Prasad M. (1987)- Management of *Bhagandar* with Darveekadi Sutra
- Nair C.R. (1989) A clinical study on comparative efficacy of two different *Ksharasutra* in the management of *Bhagandar*
- Ambura P.K. (1989) - Management of *Bhagandar* with indigenous drug
- Badrinath B. (1993)-Management of Fistula-in-ano with *Ksharasutra*
- Subha Raju (1994) - Role of *Ksharasutra* viz-a-viz section in the management rectal sepsis w. s. r. to Anal Fistula- A comparative clinical review
- Jeevarathnam G. (1995) - Management of recurrent Fistula-in-ano with Nimbadi *Ksharasutra*
- Venkateswara Rao (1996)- A Clinical Study of Ksharadi Taila in *Bhagandar*
- Babu Satish (1997) The Clinical Trial of Snuhi *Ksharasutra* in *Bhagandar* (Fistula-in-ano)
- Raja Veera M. (1998) - The role of Nishadi Taila and Nava-Karskika Guggulu in *Bhagandar* (Fistula-in-ano)
- Seeshagiri P. (2004) - The management of *Bhagandar* with Chitrakadi Kshara Sutradi and Sapta Fimshati Guggulu internally
- Satyanarayana B. (2005) - Management of Fistula-in-ano with Palashadi Kshara Sutra and Nava-Karshika Guggulu

Nagpur

- Kashikar S.V. (1992-1993) Effect of Camphor coated *Ksharasutra* in the treatment of *Bhagandar*
- Chhangani R.S. (1995) Role of Kshaudradi Sutra in the treatment of *Bhagandar* Puri
- Pradhana R.K. (2001) Study of *Bhagandar* (Fistula-in-ano)

Govt. Ay. College, Paprola.

- Pal Nagendra (2001) Role of Aragvadhadi Varti in the management of *Bhagandar* w. s. r. to Fistula-in-ano
- Sunil Kumar (2003) - Role of Jatyadi Varti in the management of *Bhagandar* w. s. r. to Fistula-in-ano

SDMCA & H, Hassan.

- Gopi Krishna B.J. (2004) - Role of *Madhu Kshara Sutra* in the management of *Bhagandar*
- Mahesh (2007) Role of *Palasha Kshara Sutra* in the management of *Bhagandar*

Akola

- Anand B.G. (1996) Effect of *Karveera Ksharasutra* in the treatment of *Bhagandar*
- Podhade S.S. (2002) - Comparative study of *Arka Ksheera Sootra* and *Nishadhyan Taila* in *Vrana-Dushti* w. s. r. to *Bhagandar* (Fistula-in-ano)

LITERATURE REVIEW

Literature will be collected related to *Bhagandar* or Fistula-in-ano from various books, articles and others resources.

RESEARCH QUESTIONS

Which treatment modality is best in present time for the management of *Bhagandar* (Transsphincteric Anal fistula)?

STATEMENT OF HYPOTHESIS

MIKST will yield better clinical and functional outcome as compared to LIFT and Standard *Apamarga Kshar Sutra* therapy in the management of *Bhagandar* (Transsphincteric Anal fistula).

Null Hypothesis –

There is no difference in the clinical and functional outcome of different surgical procedures (MIKST, LIFT and Standard *Apamarga Kshar Sutra* therapy) for the management of *Bhagandar* (Transsphincteric Anal fistula)**.**

Alternate Hypothesis –

There is difference in the clinical and functional outcomes of different surgical procedures (MIKST, LIFT and Standard *Apamarga Kshar Sutra* therapy) for the management of *Bhagandar* (Transsphincteric Anal fistula)**.**

AIM & OBJECTIVES

Aim

To adjudge the best treatment modality for *Bhagandar* (Transsphincteric Anal fistula)**.**

Objective

1. To study the efficacy of different modalities of surgical approach with reference to duration of complete healing following surgery.
2. To study the efficacy of different modalities of surgical approach with reference to recurrence of fistulae and sphincteric incontinence following surgery.

MATERIALS AND METHODS

Sample Size

Total sample size – 90

Minimum 30 patients will be randomly selected through Computer generated method for each study group with age group of 18 years and older irrespective of gender, religion etc.

Source of Subjects

OPD / IPD of P.G. Department of Shalya Tantra, National Institute of Ayurveda, Deemed to be University (De-Novo), Jaipur.

1. Informed Consent

The study will be explained clearly to the subjects in their known language and informed written consent will be taken before starting of the trial.

2. Study Design

- Randomized controlled clinical trial
- Prospective
- Interventional
- 3 Arms

3. Study Plan

Total 90 participants (30 in each group) will be selected randomly after detailed local and systemic examination. All Procedure will be done under local anaesthesia. Post-operative treatment will be given as per study protocol. Trial period of the study will be 28 days and patient will be taken for follow-up once in two week up to 3 months. Total duration of study will be 4 months.

4. Study Subjects

Participants attending the OPD and IPD of the NIA hospital and satisfying the selection criteria will be selected. All the participants who voluntarily agree to participate and provide informed written consent for participation will be recruited in the study.

INCLUSION CRITERIA

- Patient clinically diagnose as a case of Transsphincteric Anal fistula in the age group of 18 years and older of either sex.
- Patient willing to participate in the study.
- Patients with classical sign symptoms of *Bhagandara (Pidika, Daha, Puya Srava)*

EXCLUSION CRITERIA

- Patients with other systemic illnesses like uncontrolled Diabetes mellitus, Hypertension, Malignancy, Hepatitis B, Tuberculosis.
- Infective and Neoplastic conditions of rectum, Rectal prolapse, Crohn's disease.

- Cases unfit and refused for surgery.
- Patients having fistula in ano other than **Transsphincteric** type.

5. CRITERIA FOR ASSESSMENT

Primary Outcome Measures

1. **Clinical healing of fistula in ano (No fistula opening and no fistula related symptoms on clinical examination and fistuloscopy) considering duration of complete healing in each arm.**

2. **Post-Operative complications (Early)**
   - Pain (Through Visual Analogue Scale)
   - Bleeding
   - Itching
   - Pus Discharge
3. **Post-Operative complications (Late)**
   - Incontinence (Through Wexner score)
   - Stenosis (Through PASS)
   - Recurrence

Secondary Outcome Measures

- Hospital stay.
- Time to return to work.
- Patient satisfaction (Quality of life assessment- SF-36).

6. Criteria for Total Assessment of Procedure

- **Complete cure:** 100% complete relief in presenting signs and symptoms of the disease.
- **Marked improvement:** 99% -75% relief in signs and symptoms.
- **Improvement:** 74% - 50% relief of signs and symptoms.
- **No improvement:** Less than 50% Or No response in presenting signs and symptoms of disease

7. Withdrawal Criteria (Any of The Following)

- Consent withdrawn by the participant or request by the participant.
- Serious adverse events/reactions where continuation of the study poses a serious risk to the participant.
- Need to use any drugs during study, which may interfere with assessment or influence the outcome.
- Development of clinical conditions which lead to violation of Inclusion/ Exclusion criteria.

In case of withdrawals or dropouts, the investigator will assess the participant clinically and the reason for discontinuation from the study will be entered into the CRF.

DESIGN OF THE STUDY	
Number of Subjects	90 participants
Population to be Studied	Subjects from either Gender
Allocation	Randomized (Computerised Randomization Method)
Endpoint Classification	Efficacy Study
Intervention	**MIKST (MINIMAL INVASIVE KSHAR SUTRA TECHNIQUE), LIFT (LIGATION OF INTERSPHINCTERIC FISTULA TRACT) AND STANDARD APAMARGA KSHAR SUTRA THERAPY IN *BHAGANDAR* (TRANS SPHINCTERIC ANAL FISTULA)**
Duration of Trial	Total duration of Trial is 28 days
Follow Up	3 Months
Study Design	Prospective, Interventional, Comparative, 3 Arms
Time Frame	Trial with follow up period (one month trial period follow up for 3 months)
Assessment	Will be done on 1st, 2nd ,3rd and 4th week then follow up every 15th day for next 3 months

TREATMENT RECOMMENDATIONS:

Pre- Operative Treatment

- Standard pre-operative measures will be followed.

Operative Procedures

Anaesthesia

- All procedure will be done under local anaesthetic agent (Inj. Lignocaine with Adrenaline 1% solutions).
- Anaesthesia dose will be calculated as per standard dose 5-7 mg/kg body weight
- If patient is not cooperated with local anaesthesia then he/she can be planed for spinal anaesthesia (Lignocaine 5%)

Arms	Assigned Intervention
Group A (*Standard Apamarga Kshar Sutra* Therapy)	**Procedure: -** This procedure will be done under local anesthesia. Fistulous track identify with the help of probe and *Apamarga Kshar Sutra* will be applied in to the fistulous track from external to internal opening.
Group B (Minimal Invasive *Kshar Sutra* Technique)	**Procedure:** This procedure will be done under local anesthesia. Identify the fistulous track with the help of probe and a small incision will be given intersphincteric space or near the external sphincter and divide the fistulous track under direct vision and apply the *Apamarga Kshar Sutra* between created window and internal opening followed by Coring of the remaining fistulous track from external opening.
Group C (LIGATION OF INTERSPHINCTERIC FISTULA TRACT)	**Procedure-** This procedure will be done under local anesthesia. Identify the fistulous track then incision at the intersphincteric groove, identification of the inter-sphincteric portion of the tract, thorough cleaning of the tract, ligation of intersphincteric tract close to the internal opening and suturing of the defect followed by cutting the tract below the ligation.

Post-Operative Treatment

1. Proper Analgesia (Diclofenac Sodium 75mg Intramuscular/ 50mg oral) will be given as per requirement
2. Antibiotics will be given as per need
3. Antiemetic drugs (injectable /oral) will be given if needed
4. Catheterisation will be done as per need.
5. *Triphala Guggulu* 500 mg. twice daily after meal for 7 days
6. Laxative- *Haritaki Churna* 3 gm. at bedtime for 7 days with lukewarm water.
7. Sitz bath with *Tankan Bhasma* twice daily
8. Dressing with *Jatyadi Taila* will be done
9. Weekly change of *Apamarga Kshar Sutra*

DRUG REVIEW:

Apamarga Kshara Sutra-

S. No.	Dravya	Botanical Name	Used Part	Matra
1.	*Apamarga*	*Achyranthus aspera*	Whole plant	
2.	*Snuhi*	*Euphorbia nerrifolia*	Latex	
3.	*Haridra*	*Cucrcuma longa*	Rhizome	
4.	Linen thread no. 20	-	-	

LAB INVESTIGATIONS

CBC, ESR, CT-BT, RBS, HIV, HBsAG, RFT, LFT, Urine R/M, ECG,
Chest X-ray, Fistuloscopy, HPE (If needed)
MRI pelvis, RTPCR for COVID 19 (If needed)

RESULTS:

Results of the treatment will be tabulated and analysed statistically with relevant tests and level of significance will be reported.

Unscheduled Visits

A participant may visit the study site on some other day if required due to adverse effects/complications or if symptoms not getting resolved. The participant will contact the study coordinator for the same. This visit will be called as unscheduled visit. All the information will be captured at the unscheduled visit and documented.

PROPOSED CONTENT OF DISSERTATION: -

All the observations recorded and results obtained will be computerized statistically to draw variousconclusions. The project will be presented in the form of a thesis with following contents-

- ❖ Acknowledgement
- ❖ Introduction
- ❖ Review of literature
- Classical review
- Modern review
- Drug review
- ❖ Materials and Methods
- Clinical and Conceptual study
- Observations and Results
- Discussions and Conclusion
- Summary
- ❖ Bibliography

❖ Appendix

- **Annexure I** – Patient Information Sheet
- **Annexure II** – Consent Form
- **Annexure III** – Case Record Sheet

Scholar
Dr Nasreen Hanifa
M. S. (Ayu.)
Ph.D. Scholar

Supervisor
Prof. (Dr.) P. Hemantha Kumar
M.S, Ph.D. (Ayu.)
HOD & Dean PG Studies

PG Department Shalya Tantra

National Institute of Ayurveda, Deemed To Be University (De-Novo)

Jorawar Singh Gate, Amer Road, Jaipur, Rajasthan -302002

References:

[1] Sainio P. Fistula-in-ano in a defined population. Incidence and epidemiological aspects. Ann Chir Gynaecol. 1984;73(4):219-24. [PubMed] [Reference list]

[2] Shastri A. Sutra Sthana. 4th edition Vol 33. Varanasi: Chaumbika Sanskrit Sansthan; 2001. Sushrutacharya, Sushruta Samhita, Ayurved Tatva Sandipika; 2001. pp. 126–27.

[3] St John A, Caturegli I, Kubicki NS, Kavic SM. The Rise of Minimally Invasive Surgery: 16 Year Analysis of the Progressive Replacement of Open Surgery with Laparoscopy. JSLS. 2020 Oct-Dec;24(4):e2020.00076. doi: 10.4293/JSLS.2020.00076. PMID: 33510568; PMCID: PMC7810432.

[4] Rojanasakul A, Pattanaarun J, Sahakitrungruang C, Tantiphlachiva K. Total anal sphincter saving technique for fistula-in-ano; the ligation of intersphincteric fistula tract. *J Med Assoc Thai.* 2007;90(3):581–586. [PubMed] [Google Scholar]

[5] Vander Mijnsbrugge GJH, Felt-Bersma RJF, Ho DKF, Molenaar CBH. Perianal fistulas and the lift procedure: results, predictive factors for success, and long-term results with subsequent treatment. Tech Coloproctol. 2019 Jul;23(7):639-647. doi: 10.1007/s10151-019-02023-9. Epub 2019 Jul 17. PMID: 31317361; PMCID: PMC6692447.

[6] Jain BK, Vaibhaw K, Garg PK, Gupta S, Mohanty D. Comparison of a fistulectomy and a fistulotomy with marsupialization in the management of a simple anal fistula: a randomized, controlled pilot trial. J Korean Soc Coloproctol. 2012 Apr;28(2):78-82. doi: 10.3393/jksc.2012.28.2.78. Epub 2012 Apr 30. PMID: 22606646; PMCID: PMC3349814.

[7] Ratto C, Litta F, Donisi L, Parello A. Fistulotomy or fistulectomy and primary sphincteroplasty for anal fistula (FIPS): a systematic review. *Tech Coloproctol.* 2015;19(7):391–400. doi: 10.1007/s10151-015-1323-4. [PubMed] [CrossRef] [Google Scholar]

[8] Stamos MJ, Snyder M, Robb BW, Ky A, Singer M, Stewart DB, Sonoda T, Abcarian H. Prospective multicenter study of a synthetic bioabsorbable anal fistula plug to treat cryptoglandular transsphincteric anal fistulas. Dis Colon Rectum. 2015 Mar;58(3):344-51.

[9] Uribe N, Balciscueta Z, Mínguez M, Martín MC, López M, Mora F, Primo V. "Core out" or "curettage" in rectal advancement flap for cryptoglandular anal fistula. Int J Colorectal Dis. 2015 May;30(5):613-9. [PubMed]

[10] Jiang HH, Liu HL, Li Z, Xiao YH, Li AJ, Chang Y, Zhang Y, Lv L, Lin MB. Video-Assisted Anal Fistula Treatment (VAAFT) for Complex Anal Fistula: A Preliminary Evaluation in China. Med Sci Monit. 2017 Apr 30;23:2065-2071. doi: 10.12659/msm.904055. PMID: 28456815; PMCID: PMC5421740.

[11] Carr S, Velasco AL. Fistula In Ano. [Updated 2022 Aug 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557517/